ITEM 185 FY90
CEL-DS1
June 20, 1988

PURCHASE DESCRIPTION

SYNTHESIZED SIGNAL GENERATOR (1 MHz to 1.3 GHz)

FSNSE-A

1.0 GENERAL This procurement requires a programmable synthesized signal generator employing no more then two plug-ins and covering a frequency range of 1 MHz to 1.3 GHz.

2.0 CLASSIFICATION The synthesized signal generator described herein shall meet the requirements of MIL-T-28800D, Type III, Class 5, Style E, Color R for the Navy shipboard, submarine, and shore applications with the following exceptions:

a. The non-operating temperature requirement is limited to the range of -40˚C to +70˚C.

b. The relative humidity requirement is limited to 95% noncondensating.

c. The operating and non-operating altitude requirements are not invoked.

d. The EMI requirement is not invoked.

e. The warm-up time is extended to 72 hours.

3.0 OPERATIONAL REQUIREMENTS. The equipment shall be capable of generating signals within the parameters and accuracies specified herein.

3.1 Frequency Characteristics

3.1.1 Frequency Range: At least 1 MHz to 1.3 GHz

3.1.2 Frequency Resolution: 1 Hz; digital readout

3.1.3 Frequency Stability

3.1.3.1 Internal: At least $\pm 3 \times 10^{-9}$/day
3.1.3.2 External: Equal to external standard frequency stability

3.1.4 Spectral Purity

3.1.4.1 Harmonics/Sub-harmonics: At least -25 dBc
3.1.4.2 Non-Harmonics/Spurious: At least -50 dBc
3.1.4.3 Single Sideband Phase Noise: Less than -90dBc/Hz at 10 kHz offset

3.1.5 Reference Frequency

3.1.5.1 Internal Reference Oscillator: 10 MHz
3.1.5.2 External Reference Oscillator: 5 or 10 MHz, 0.5 to 2.0 Vrms into 170 ohms

3.2 Output Characteristics

3.2.1 Range: +10 to -140 dBm

3.2.2 Accuracy: ±2.0 dB over entire range

3.2.3 Flatness: ±1.0 dB

3.2.4 Digital Sweep: Auto, single, or manual operation with selectable speeds 0.1, 1.0 or 50 seconds

3.3 Modulation Characteristics

3.3.1 Amplitude Modulation

3.3.1.1 Internal
3.3.1.1.1 Rate: At least 400 Hz and 1 kHz ±5%
3.3.1.1.2 Depth: At least 0 to 90%
3.3.1.1.3 Accuracy: ±10% of full scale
3.3.1.1.4 Distortion: Less than 5% at 50% depth and 1 kHz rate

3.3.1.2 External
3.3.1.2.1 Rate: At least 20 Hz to 50 kHz for carrier frequencies > 10 MHz; at least 20 Hz to 5 kHz for carrier frequencies < 10 MHz
3.3.1.2.2 Depth: At least 0 to 90%
3.3.1.2.3 Accuracy: ±10% of full scale
3.3.1.2.4 Distortion: Less than 5% at 50% depth and 1 kHz rate
3.3.1.2.5 Input Impedance: 600 ohms

3.3.2 Frequency Modulation

3.3.2.1 Internal
3.3.2.1.1 Rate: At least 400 and 1 kHz ±5%
3.3.2.1.2 Deviation: At least 0 to 100 kHz (phase locked); 0 to 200 kHz (high deviation)
3.3.2.1.3 Accuracy: ±5% of full scale

3.3.2.2 External
3.3.2.2.1 Rate: At least 20 Hz to 100 kHz
3.3.2.2.2 Deviation: At least 0 to 100 kHz (phase locked); 0 to 200 kHz (high deviation)
3.3.2.2.3 Distortion: Less than 2% for dev < 100 kHz, at rates < 20 kHz
3.3.2.2.4 Input Impedance: 600 ohms

4.0 General Requirements

4.1 Power: 115/230 Vac ±10%, single phase, 50, 60 or 400 Hz ±10%, 350 watts maximum

4.2 Dimensions: The total volume of the unit shall not exceed 2828 in^3 (46,342 cm^3) with a maximum height of 7.25 in.

4.3 Weight: The total weight of the unit shall not exceed 66 lbs (30 kg).

4.4 Calibration Interval: After calibration, the equipment shall meet each performance requirement within the tolerance specified for a period of at least 12 months.

4.5 Remote Control: Instrument must be capable of operating via the IEEE-488 interface bus and shall provide the capability to talk and listen.